



# Lessons learnt from field experiments:

Inspection of the **ALPEX-PYREX-MAP-COPS** chain

*Atlanta/Boulder 19 Jan 2010*

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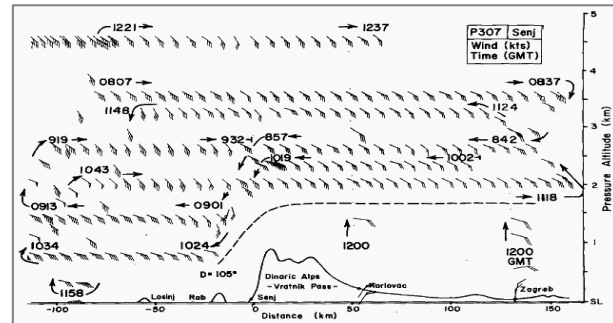


in memoriam: **Joachim Paul KUETTNER**

21 Sep. 1909 – 24 Feb. 2011

# ALPEx:

*the arena*



*a/c obs. of bora flow*

# SOP March & April 1982

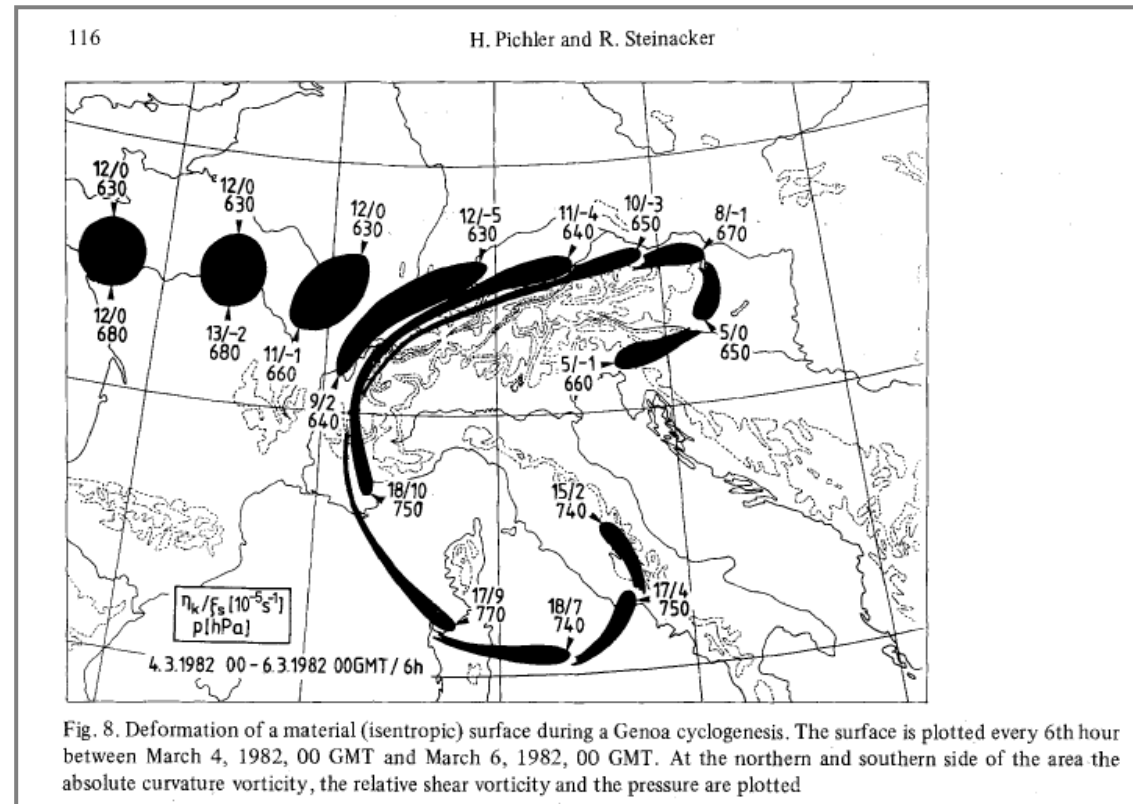


Fig. 8. Deformation of a material (isentropic) surface during a Genoa cyclogenesis. The surface is plotted every 6th hour between March 4, 1982, 00 GMT and March 6, 1982, 00 GMT. At the northern and southern side of the area the absolute curvature vorticity, the relative shear vorticity and the pressure are plotted

*air parcel deformation by lee cyclone over 54 h*

## Results contained in collections/special issues:

- 1) H. Kraus (ed.), 1984/85 Beitr.Phys.Atmos. **57/58**, interspersed papers after IUGG-1983; **12** articles
- 2) ICSU-WMO, 1986: Scientific Results of ALPEx, 2 Vols., GARP Series Nr. 27, WMO, 710pp.; **58** contrib.
- 3) E.R. Reiter, J.P.Kuettner (eds.), 1987: Meteor.Atmos.Phys. **36**, 1-296; **19** articles
- 4) H.C. Davies, H.Pichler (eds.), 1990: Meteor.Atmos.Phys. **43**, 3-240; (partly → **PYREX**) **23** articles

# PYREX:

## SOP Oct. & Nov. 1990

*the arena*

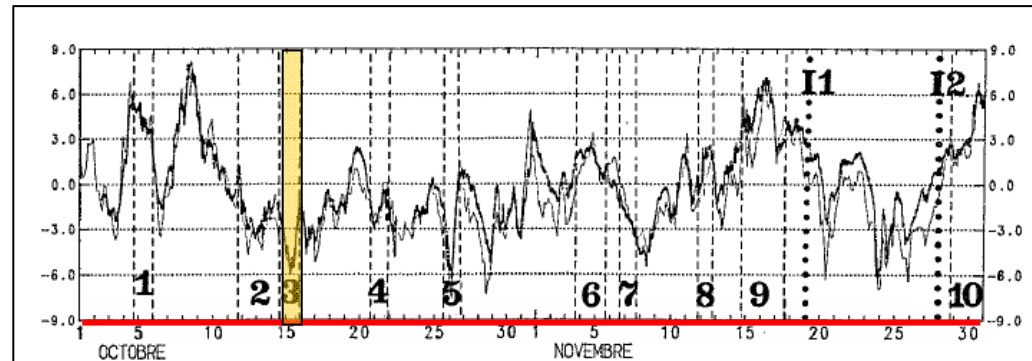
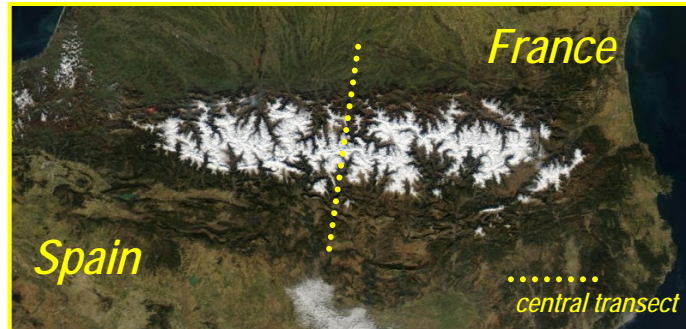


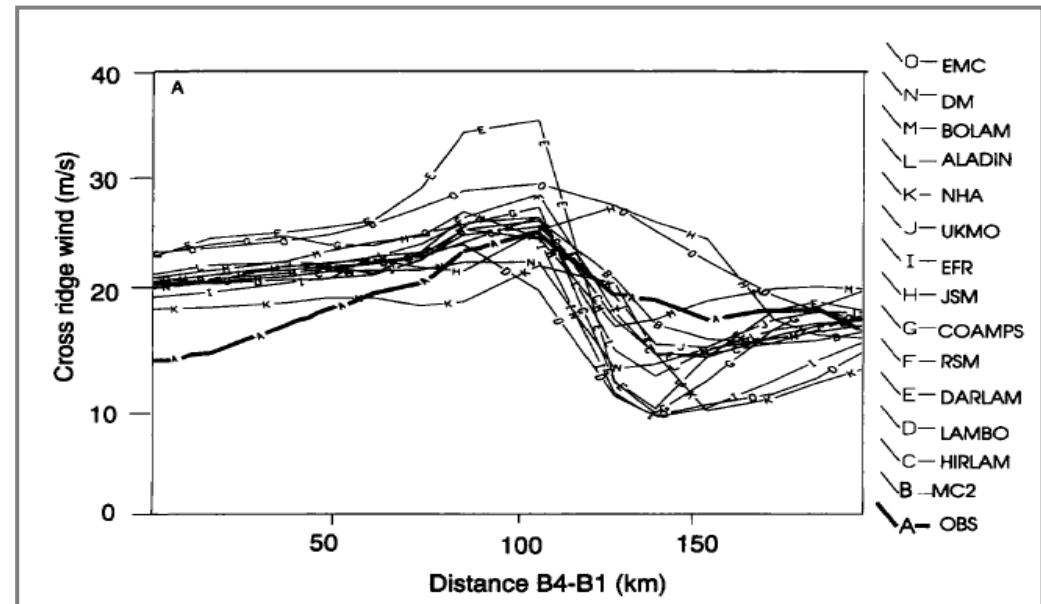
FIG. 5. The time series of the values of the pressure drag in the central part of the range, from Bessemoulin et al. (1993). Numbers indicate the IOPs and the intercomparison flights.

*central section pressure drag*

### selected refs.:

- 1) Bessemoulin et al., 1993: BPA 66, 305-325
- 2) Bougeault et al., 1997: BAMS 78, 637-650
- 3) Georgelin et al., 2000: QJ 126, 991-1029

*Simulated winds too fast,  
mountain waves too large*



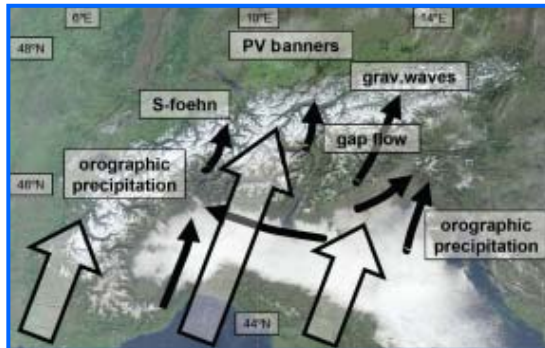
*model comparison: 545 hPa cross-ridge wind*



# MAP

*the arena*

## SOP 7 Sep. - 15 Nov. 1999



### Results i.a. in collections/special issues:

- 1) Bougeault et al., 2001: BAMS 82, 433-462 226 quotes in ISI-art.
- 2) Bougeault et al. (eds.), 2003: QJ 129, 341-895; 25 articles
- 3) Volkert et al. (eds.), 2007: QJ 133, 809-967; 9 review articles

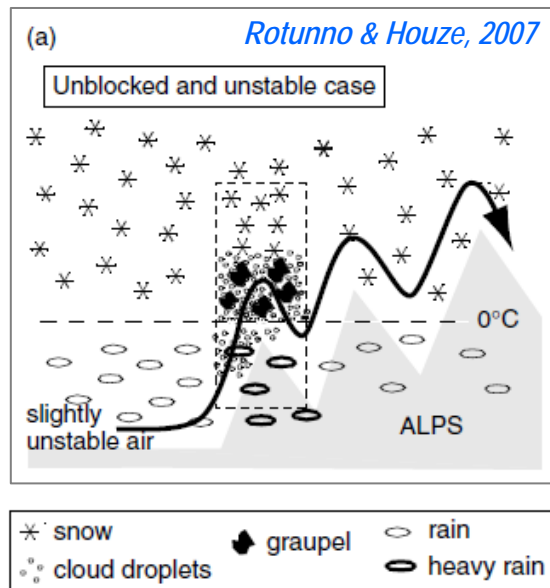


Figure 15. Conceptual model of the airflow and microphysics of orographic precipitation mechanisms in MAP cases of (a) unstable unblocked low-level flow, and (b) stable blocked low-level flow (adapted from Medina and Houze, 2003a).

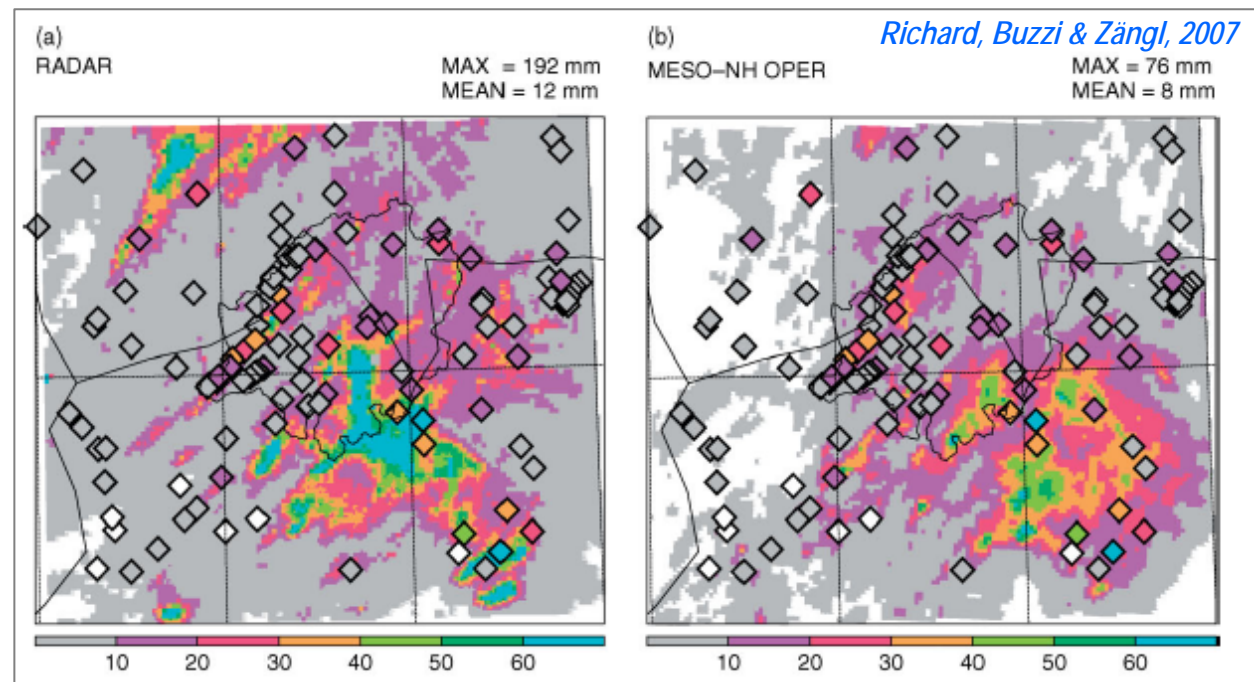
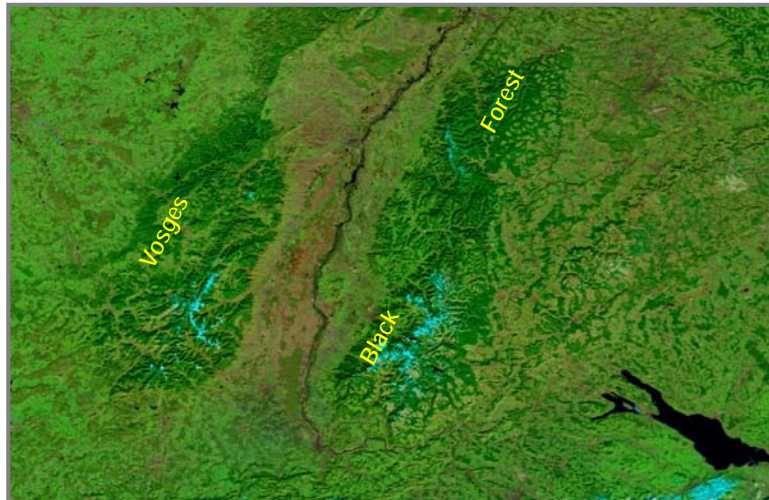


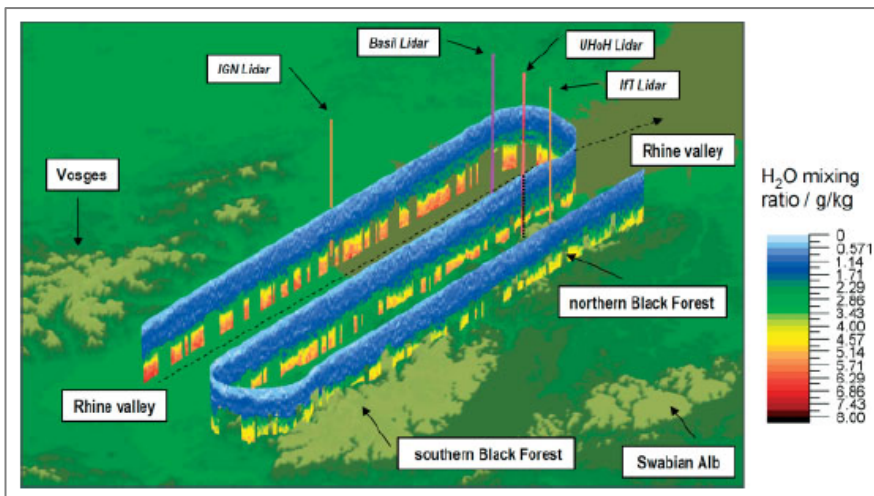
Figure 4. 12-hour accumulated rainfall (mm) at 00 UTC on 18 September 1999 (IOP 2a): (a) Radar-derived precipitation superimposed with raingauge observations (diamonds). (b), (c) and (d) MESO-NH computations with a model suite based upon OPER, MAPRA, and CNTRL analyses, respectively. The thin black lines indicate the Toce-Ticino watershed location, and the political borders between France, Switzerland, and Italy.

# COPS

*the arena*



*IOP 12: 30 July 2007*



# SOP June – Aug. 2007

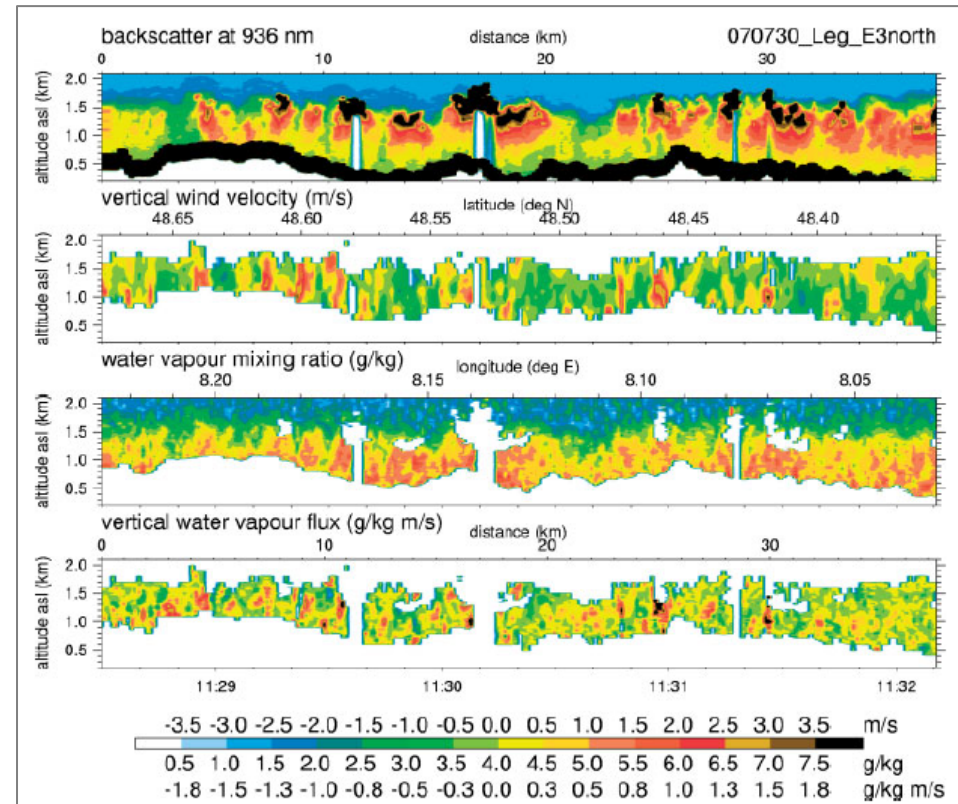


Figure 3. Aerosol backscatter intensity (in arbitrary units; top), vertical motion (updraughts positive), humidity and water vapour flux above the Black Forest on 30 July 2007 over the northern part of flight leg E. The Hornisgrinde Mountain (H in Figure 2) was overflown at 1129 UTC. Local time is two hours ahead. The aspect ratio is  $\sim 1:3$ , the average CBL depth is  $\sim 1$  km. Convection, cumulus clouds and orographic influences produce an irregularly structured boundary layer. A few intense updraughts generate most of the flux.

Results i.a. in special issue:

Wulfmeyer, Flamant et al., 2011: QJ 137, Suppl.1, 1-348

21 articles



Field experiments with time: extensive videos at [www.archives.ucar.edu/exhibits/kuettner](http://www.archives.ucar.edu/exhibits/kuettner)


http://www.archives.ucar.edu/exhibits/kuettner/The%20Joachim%20Kuettner%20Symposium%20at%20the%2090th%20America

Bearbeiten Ansicht Favoriten Extras ? Konvertieren Auswählen

CO Meeting Organizer EGU2... Menüleiste und Symbolleiste... 11. IUGG 2011 SPC Agenda... ACP - Manuscript Preparation http--www.atmos-chem-ph... IAMAS Ho

Joachim Kuettner Symposium at the 90th American...

## The Joachim Kuettner Symposium at the 90th American Meteorological Society Annual Meeting



Dr. Richard Anthes, Prof. Ronald Smith, Dr. Hans Volkert, Prof. Vanda Grubišić, Dr. Jay Fein, Dr. V. Ramanathan, Mr. Einar Enevoldson

Click below to hear the presentations given in Dr. Kuettner's honor at the Joachim Kuettner Symposium.

*Video courtesy of UCAR Communications and Carlye Calvin.*

[Dr. Jay Fein](#), Kuettner Symposium Chair, Former Program Director, Climate and Large Scale Dynamics, National Science Foundation, Arlington, VA, Master of Ceremonies

[Dr. Richard Anthes](#), President, UCAR, Boulder, CO; "An Introduction to Joach Kuettner - A Renaissance Man of Meteorology"

[Dr. Hans Volkert](#), Institute for Atmospheric Physics, German Center for Aeronautics and Astronautics, Wessling, Germany "Young Joachim Kuettner Searching for Law in Disorder: Detecting Waves and Rotors through Intuitive Multi-Disciplinary"

[Mr. Einar Enevoldson](#), The Perlan Project, Emeryville, CA "Joach Kuettner - A Man in Love with the Sky"

[Prof. Ronald Smith](#), Yale University, New Haven, CT "Mountain Wave Research and Aviation Technology"

[Prof. Vanda Grubišić](#), University of Vienna, Vienna, Austria "Rotor Puzzle"

**RBS: „packing together new technologies for MWR as they come along“**

# General observations, i.e. „**lessons**“:

- scientific objectives hardly very strict, but **bundled**;
- processes **combined** rather than separated;
- even large teams are **small** compared to e.g. engineering;
- **„persuasion“** of sponsors takes much time & energy;
- progress often via **subtleties** (which are easily forgotten);
- difficult **integration** between subdisciplines & countries;
- **chain** effect over several campaigns important (every **7 a?**);
- field experiments essential for our **Sisyphos-type** efforts;
  
- Sisyphos was considered a **happy** person;
- more happiness through **HYMEX** ?!

## **JPK's closing words on 19 Jan 2010** (end of Wirth's video):

„I didn't expect at all that you would have so much information about things that I have been concerned with, but I would like to tell my conclusion: that if you have the opportunity to collect these little colored **mosaic stones**, one blue, one white, that they may in the end add up as something worthwhile doing, and that is really what I have tried to do in my life. But I have never heard such a combination of talks in which I was involved until I heard it today. As I look back at my friends, those that are still around and those that have left us, I can only say that I feel today

as the **owner** of a beautiful **mosaic**, namely your contributions.“

**Even if all our work is necessarily fragmentary,  
fine mosaics do evolve;  
field experiments remain an **essential** ingredient**